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16:9

Aspect ratio most commonly known as widescreen or letterbox. It is wider than the standard 4:3 aspect ratio. 16:9 supporters state that the wider picture corresponds much better to the human visual field than the almost square 4:3.

4:3

Traditional nearly square aspect ratio used for most current analog television screens and IMAX movie theater screens. This aspect ratio will slowly be phased out in favor of the wider, more panoramic and movie-like 16:9 ratio. Video displays using a 4-by-3 ratio display images 4 units wide (horizontal measure) by 3 units tall (vertical measure). The 4:3 ratio performs fine for television programming, which was designed for it, but it creates problems with movie material originally designed for theater release. The movies are created with a wider, more rectangular aspect ratio (16:9 or wider) in order to create a larger viewing surface and bring the viewer more into the film. On a traditional 4-by-3 aspect ratio display, these movies must be letterboxed or cut down in size (pan & scan).

5.1 Audio

In contrast to the Stereo sound system and conventional Surround Systems, this sound system offers five separate full band audio signals: Left, middle, right, rear left, rear right. An additional subwoofer (LFE) channel is also provided.

Anamorphic

Process where a "wide" video image (typically in a 16:9 widescreen format) is compressed or squeezed horizontally to fit a more narrow video display standard but expands to full size when played over a wide video display. Letterboxing an image enables the viewer to see the entire widescreen presentation of a movie as it was intended and as it was shown in the theater. However, in order to fit a "wide" image in a "narrow" television, the wide image must be centered in the screen with black bars above and below it (in order to fit a wide image in a narrow screen, the width must match the width of the narrow display so the height of the image is necessarily less than that of the more narrow and square video display). While this method allows the user to see the entire image as it was meant to be seen (narrow 4:3 aspect ratio television sets normally show pan & scan movies), the image loses some horizontal resolution to the black bars. While not much can be done about this on standard 4:3 televisions, there are wider 16:9 displays, which can show an entire movie image with no bars thus allowing the picture to fill the screen. To take advantage of this, a movie can be distributed in a squeezed anamorphic format without black bars. On a more square 4:3 television this results in an image which seems tall and pinched with actors looking too narrow and objects distorted. However, when played on a widescreen display, the picture is stretched out to its proper width resulting in a widescreen image with no bars and the maximum possible resolution. This technique is being used primarily with DVDs to provide superior quality video to users of widescreen televisions. DVDs featuring this anamorphic version allow a user to watch the image in a letterboxed or pan & scan format on their traditional more square 4:3 televisions when this is selected while allowing users with widescreen televisions to enjoy the full benefit of their displays.

Anti-aliasing

A method of smoothing jagged edges on screen and in image files.

Aperture

Opening created by the iris diaphragm between the camera lens and the CCD. As the iris opens wide, the size of the aperture increases, and more light is able to hit the CCD.

Artifact

An unnatural effect not present in the original video or audio, produced by an external agent or action. Artifacts can be caused by many factors, including digital compression, film-to-video transfer, transmission errors, data readout errors, electrical interference, analog signal noise, and analog signal crosstalk. Most artifacts attributed to the digital compression of DVD are in fact from other sources. Digital compression artifacts will always occur in the same place and in the same way. Possible MPEG artifacts are mosquitoes, blocking, and video noise.

Aspect Ratio

The width-to-height ratio of an image. A 4:3 aspect ratio means the horizontal size is a third again wider than the vertical size. Standard television ratio is 4:3 (or 1.33:1). Widescreen DVD and HTDV aspect ratio is 16:9 (or 1.78:1). Common film aspect ratios are 1.85:1 and 2.35:1. Aspect ratios normalized to a height of 1 are often abbreviated by leaving off the :1.



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AVI

Audio Video Interleaved, one of two main families for video – the other is Quicktime.

Batch Capture

Automated capture of several separate video clips. Start and end points for clips are logged on the editing system, which then takes on the job of controlling the camcorder or VCR and bringing in only the specified material.

BIOS

Basic Input-Output System: the chip, or set of chips, in a computer that controls how the computer communicates with hardware components, such as disk drives and keyboard.

Bitrate

Bitrate or Bit Rate is the average number of bits that one second of video or audio data will consume. Higher bitrate means bigger file size and generally better video or audio quality while lower bitrate means lower file size but worse video or audio quality. Some bitrate examples in common video and audio files:

MP3 about 128 kbps (kilobits per second)

VCD about 1374 kbps

DVD about 4500 kbps

DV about 25 Mbps (megabits per second).

BMP

The file extension given to Windows graphics files saved in an enhanced Device Independent Bitmap (DIB) format.

Capture Card

Board fitted to a computer that enables an analogue video signal from a camcorder or VCR to be converted to a digital signal in a form that can be read and processed by a computer. It then performs the opposite process, playing back to a recorder. Essential for editing analogue tape.

CCD

Charge-Coupled Device. The image recording chip inside the camcorder on which the light falls.

Chapter

A DVD 'Chapter' (somewhat confusingly referred to as a 'Part' in the parlance of DVD authors) is generally a logical segment of a Title such as a scene in a film or one interview in a set of cast interviews. There can be up to 999 Chapters in one DVD Title.

Chroma Key

Electronic process whereby a plain background (usually green or blue) is replaced by a video image. Non-green (or blue) subjects in the scene are then seen against the new background. As in TV weather broadcasts, where the weather map is seen behind the presenter.

Chrominance

The colour component of the video signal, denoted by the letter 'C'. In high-band camcorders (such as Hi-8 and S-VHS), the video signal is split into luminance (brightness) and chrominance (colour). Processing the two signals separately helps improve the picture quality and avoid effects such as moiré patterning – the tartan like interference seen on fine patterns in a scene.

Coaster

An authored disc that won't play, either due to improper authoring, poor media quality, or write error. The name is derived from the disc's uselessness as a DVD/VCD, may as well be used to set drinks on.

Codec

Compressor / Decompressor, compresses (packs) and decompresses (unpacks) image data. Compression Codecs can use software or hardware to carry out tasks.

Component

Video systems that process the chrominance and luminance signals separately between recording and viewing. Used in



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high-band analogue and digital systems, it results in sharper pictures and richer colours.

Composite Video

Combination of chrominance and luminance signals, which are processed together in low-band (8mm, VHS) camcorders. Using this system reduces the cost of equipment but also the quality of the signal.

Compression

Reducing the size of a file on disk or in memory. Compression can be lossless (ie compressed without any loss of information) or lossy, in which some information is discarded, on the assumption that the loss will not be noticeable when the data is decompressed.

CPU

Central Processing Unit. The heart and lungs of a computer. The Pentium, PowerPC, and Athlon are examples of modern CPUs.

Defragment

The process of re-arranging files on a disk so that files larger than one cluster in size are stored in adjacent clusters, rather than scattered over the disk. If a hard disk contains many fragmented files (caused by repeatedly writing and erasing to/from a disk) programs will run slowly, because it takes longer to read/write files.

Deinterlace

The process of creating a single frame from the 2 interlaced fields of a video frame. Deinterlacing is used to remove the interlacing artifacts if a still frame is required, or if the video is being used at a different rate than it was created.

Device Control

The ability to control a camcorder or VCR from the computer itself. This is a common feature in DV editing, where DV devices can be controlled by a computer via Firewire.

DivX

DivX™ is a new format for digital video, much like MP3 is a format for digital music. DivX™ is the brand name of a patent-pending video compression technology created by DivXNetworks, Inc., (also known as Project Mayo). The DivX™ codec is based on the MPEG-4 compression standard. This codec is so advanced that it can reduce an MPEG-2 video (the same format used for DVD or Pay-Per-View) to ten percent of its original size.

Dolby Digital

Dolby's best-known digital system, is used to provide multichannel surround sound in cinemas from 35 mm film, and in the home from laser discs, DVDs, and digital broadcast television, cable, and satellite systems. It enables the transmission and storage of up to five full-range audio channels, plus a low-frequency effects channel (LFE), in less space than is required for just one linear PCM-coded channel on a compact disc.

Driver

Software used to make computer peripherals – such as graphics adapters, printers and soundcards etc. – work with a particular type of computer.

Dual-stream

A dual-stream video editing system can take two full streams of video and mix them instantly together into a single stream, with no waiting for rendering. Usually describes system where video transitions, effects and titles are added instantly to a single stream of video.

DV

Digital Video. Format which replaces the older analogue format. DV is stored on cassettes in different formats such as Mini-DV and DVCAM. DV is a digital format and therefore does not suffer from loss of quality when captured or transferred onto a computer using a Firewire cable.



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DVD

Digital Versatile Disc. A high capacity disc similar in size to a CD. DVD is most commonly used to store and distribute high quality video in MPEG2 format.

EIDE

Enhanced Integrated Drive Electronics is a standard electronic interface between your computer and its mass storage drives (mainly hard drives but also CD and DVD Readers and Writers with help of the ATAPI interface).

Firewire

FireWire is a fast peripheral interconnect standard capable of transfer speeds up to 400 Mbs. It works well for multimedia peripherals such as DV (Digital Video) cameras and other high-speed devices like the latest hard disk drives, CD/DVD burners and printers. Apple FireWire information.

Gigabyte

1024 Megabytes.

GOP

Group Of Pictures. A Group Of Pictures (GOP) consists of all the pictures that follow a GOP header before another GOP header.

The GOP layer allows random access because the first picture after the GOP header is an Intra picture that means that it doesn't need any reference to any other picture.

The GOP layer is optional, i.e. it's not mandatory to put any GOP header in the bitstream.

In the header there is also the timecode of the first picture of the GOP to be displayed.

The decoding process, as the GOP header is immediately followed by an Intra picture, can begin at that point of the bitstream. Anyway it's possible that some B pictures, following such I_picture in the bitstream, have references coming from the previous GOP and can't be correctly decoded.

In this case the GOP is called an Open GOP because some references from the previous GOP exist; if a random access to such a GOP is performed, some B_pictures shouldn't be displayed .

A GOP is called a Closed GOP when either there are no B_pictures immediately following the first I_picture or such B_pictures haven't any references coming from the previous GOP (in this case a GOP header flag must be set).

In the "coding people" language the GOP length is the period (often expressed in frames) by which an Intra frame occurs. It must be noticed that such a value cannot be found in the bitstream and it is unnecessary to the decoding process. Furthermore it isn't specified any fixed period for the Intra frame. As the presence of the Intra frames is quite important for many applications, it is the encoder that has to provide them, while the decoder has only to work with all the valid bitstreams.

Hard Disk

A disk drive normally fitted within a PC, on which the operating system and programs / data are stored. Access times on hard disks are many times faster than that of floppy disks and CDs.

HDTV

High Definition Television. Abbreviated HDTV, this is high-resolution digital television (DTV) combined with Dolby Digital surround sound (AC-3). HDTV is the highest DTV resolution in the new set of standards. This combination creates a stunning image with stunning sound. HDTV requires new production and transmission equipment at the HDTV stations, as well as new television equipment for reception by the consumer. The higher resolution picture is the main selling point for HDTV. Imagine 720 or 1080 lines of resolution compared to the 525 lines people are used to in the United States (or the 625 lines in Europe) -- it's a huge difference!

Of the 18 DTV formats, six are HDTV formats, five of which are based on progressive scanning and one on interlaced scanning. Of the remaining formats, eight are SDTV (four wide-screen formats with 16:9 aspect ratios, and four conventional formats with 4:3 aspect ratios), and the remaining four are video graphics array (VGA) formats. Stations are free to choose which formats to broadcast.

The formats used in HDTV are:

720p - 1280x720 pixels progressive

1080i - 1920x1080 pixels interlaced

1080p - 1920x1080 pixels progressive



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High-band

The better quality analogue video formats – Hi8, S-VHS and High-Band U-Matic. Chrominance (colour) and Luminance (brightness) are processed separately in such systems for better resolution than in low-band.

IEEE1394

The standard name for Firewire.

IRQ

Interrupt Request Line. The ID number used by hardware to identify itself to the central processor.

Low-band

Standard analogue camcorder formats – VHS, 8mm & Low-Band U-Matic.

Macrovision

An analog video copy protection scheme that alters the unseen part of a video signal such that a VCR or other macrovision enabled device may not record the video signal properly. There are several types:

- Automatic Gain Control
- 2-line color stripe
- 4-line color stripe

Symptoms of this include picture fading in and out or color banding of the signal.

Megabyte

1024 Kilobytes.

MP3

MP3 is an acronym for MPEG-1 (or MPEG-2) Layer 3 audio encoding (it is not an acronym for MPEG3). MP3 is a popular compression format used for audio files on computers and portable devices.

The compression in MP3 works on the basis of a "psychoacoustic model" which means that parts of the audio that human ears cannot detect are discarded by the encoder. Although this is a LOSSY process, it can yield very high quality audio files are relatively high compression rates.

A typical MP3 file encoded at 128 kbit/s (12:1 compression) is near CD quality.

MP3 audio is increasingly being used in video production coupled with various MPEG-4 video codecs like divx. The audio may be encoded with a constant or variable bitrate.

MPEG

The Motion Picture Experts Group standard for video compression. It achieves much of its file size reduction by recording only certain critical frames, plus the changes between them. MPEG1 is the standard used for Video CD, MPEG2 is used for DVD, and MPEG4 is becoming accepted for use in web based video and digital television.

MPEG-1

An ISO/IEC (International Organization for Standardization/ International Electrotechnical Commission) standard for medium quality and medium bitrate video and audio compression. It allows video to be compressed by the ratios in the range of 50:1 to 100:1, depending on image sequence type and desired quality. The encoded data rate is targeted at 1.5Mb/s - this was a reasonable transfer rate of a double-speed CD-ROM player (including audio and video). VHS-quality playback is expected from this level of compression. The Motion Picture Expert Group (MPEG) also established the MPEG-2 standard for high-quality video playback at a higher data rates. MPEG-1 is used in encoding video for VCD.

MPEG-2

An encoding standard designed as an extension of the MPEG-1 international standard for digital compression of audio and video signals. MPEG-1 was designed to code progressively scanned video at bit rates up to about 1.5 Mbit/s for applications such as CD-i. MPEG-2 is directed at broadcast formats at higher data rates; it provides increased support for efficiently coding interlaced video, supports a wide range of bit rates and provides for multichannel surround sound coding such as PCM, Dolby Digital, DTS and MPEG audio.



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MPEG-3

A proposed variant of the MPEG video and audio compression algorithm and file format. MPEG-3 was intended as an extension of MPEG-2 to cater for HDTV but was eventually merged into MPEG-2. MPEG-3 should not be confused with MP3 which is MPEG-1 layer 3 popularly used for audio encoding.

MPEG-4

An ISO/IEC standard 14496 developed by the Moving Picture Experts Group (MPEG), the committee that also developed MPEG-1 and MPEG-2. These standards made interactive video on CD-ROM, DVD and Digital Television possible. MPEG-4 is the result of another international effort involving hundreds of researchers and engineers from all over the world. MPEG-4 was finalized in October 1998 and became an International Standard in 1999. The fully backward compatible extensions under the title of MPEG-4 Version 2 were frozen at the end of 1999, to acquire the formal International Standard Status early in 2000. Several extensions were added since and work on some specific work-items is still in progress. MPEG-4 builds on the proven success of three fields:

- Digital television
- Interactive graphics applications (synthetic content)
- Interactive multimedia (World Wide Web, distribution of and access to content)

NLE

Non-Linear Editing. Using computer to edit video. Video stored on hard disk can be accessed instantly anywhere within and at any point within the length of the video. In order to edit non-linear video you require some editing software such as Adobe Premiere, Pinnacle Studio or Apple Final Cut Pro.

NTSC

National Television Standards Committee. The TV system used in the US and Japan.

OHCI

Open Host Controller Interface. Agreed standard (normally for USB and Firewire) enabling peripheral makers to produce cheaper standard hardware and software.

PAL

Phase Alternating Line. The TV standard used in Western Europe, Australia, East Africa, India and China.

Pan & Scan

The technique of reframing a picture to conform to a different aspect ratio by cropping parts of the picture. DVD-Video players can automatically create a 4:3 pan & scan version from widescreen video by using a horizontal offset encoded with the video, which allows the focus of attention to always be visible.

Partition

Hard disks can be partitioned to create two or more logical hard disk drives. This can be done for a number of reasons, most commonly to create a dual-boot system where the user can use two separate operating systems.

Pixel

Pictuer Element. A single dot which is the smallest unit displayed on a computer monitor or in a digital image, and the smallest imaging element on a camcorders CCD.

Pixel Aspect Ratio

The ratio of width to height of a single pixel. Often means sample pitch aspect ratio (when referring to sampled digital video). Pixel aspect ratio for a given raster can be calculated as y/x multiplied by w/h (where x and y are the raster horizontal pixel count and vertical pixel count, and w and h are the display aspect ratio width and height). Pixel aspect ratios are also confusingly calculated as x/y multiplied by w/h , giving a height-to-width ratio.

RAM

Random Access Memory. The memory used to run programs and hold data while programs are running. Anything held in RAM is lost when the computer is turned off.



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Real-time

Traditionally NLE systems had to render all effects such as transitions, filters and titles before they could be played back. More modern editing systems using dedicated capture cards can play back video without having to render such effects. This is called real-time as the user does not have to wait for the computer to render the video before playing back.

Region Coding

Region coding is how Hollywood studios stagger DVD movie releases across the planet. These codes ensure that one country doesn't get a DVD movie before the same movie is out in that country's theatres. In their corporate omniscience, movie studios have carved the planet into regions with each region having a specific code.

All DVD players and discs have region codes. A DVD player and disc must be of the same region or the disc will not play. If you want to watch movies from other countries, you need a multiregion DVD player. This will allow you to play any disc from any region. However, because TV standards differ, you might need a specialized NTSC/SECAM/PAL TV or a DVD player that can output any signal to the standard your TV accepts.

Rendering

A process of recalculating the individual picture elements (pixels) in a frame of video, to reflect changes made to that frame during editing. The more powerful the computer, the quicker rendering will be.

SCSI

Small Computer System Interface is a standard electronic interface between your computer and its peripherals (hard drives, CD and DVD Readers and Writers and other peripherals).

SECAM

Sequentiel Couleur avec Mémoire. The TV standard used in Eastern parts of Europe and in France.

Time Base Corrector

A hardware device used to remove or mask variations in the video synchronizing signals, which can result in "skewing" and other distortions in the video image generated by unavoidable mechanical inaccuracies in helical scan recorders. This is accomplished by automatically delaying the video signal so that each line starts at the proper time. In capturing a TBC is used to 'clean up' analog tape problems and may assist in the capture of old VHS tapes when used between a VCR and capture card. Hardware TBCs can be expensive.

Timecode

A system that allocates an individual label to each frame of video, based upon hours, minutes, seconds and frames. Used to ensure accuracy when editing.

USB

Universal Serial Bus is the solution for all PC users who want an instant, no-hassle way to connect new hardware like digital joysticks, scanners, digital speakers, digital cameras or a PC telephone to their computer. USB makes adding peripheral devices extremely easy. With USB-compliant PCs and peripherals, you just plug them in and turn them on. USB 2.0 (USB2) is the latest USB technology. This technology is approximately forty times faster than the previous USB 1.1 technology, increasing the speed of the device to PC connection from 12Mbps on USB 1.1 to up to 480Mbps on USB 2.0.

VCD

Video CD. A popular video distribution format in the far East. One hour of MPEG1 can be stored on a VCD. VCDs can be played back in most modern DVD players. Becoming popular amongst amateur film makers in the UK.

Widescreen

A video image wider than the standard 1.33 (4:3) aspect ratio. When referring to DVD or HDTV, widescreen usually indicates a 1.78 (16:9) aspect ratio.

Y/C

Component video using separate luminance (Y) and chrominance (C) signals – S-VHS and Hi-8 quality.



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YUV

The analog luminance and color-difference components of a color image (in digitized form, as Y, Cr, Cb, in JPEG) or video (NTSC and PAL). If you take the typical Red, Green, Blue colorspace (RGB), you can get YUV from:

Y (or Luma)= 30% Red + 59% Green + 11% Blue Analog Luminance

U (or Cb)=R-Y the red signal component minus the luminance

V (or Cr)=B-Y the blue signal component minus the luminance

The large percentage of Green and the small percentage of Blue (along with Green being sent twice) help to explain why chroma-keying for video is done against greenscreens and not bluescreens like film.

YUV was originally developed for backward compatibility with black-and-white television.

Originally, TV stations only transmitted the black and white signal. When color TV was to be deployed, most people still only owned a black-and-white set. It became clear that transmitting an RGB signal separately from a black-and-white signal would be highly impractical. A system was needed in which a TV station could transmit a signal that could be seen as monochrome on the older but still common black-and-white TV sets, but the same signal should be in color on the new color TV sets. YUV encoding allows the signal had to continue to have the black-and-white image, and the color information is added to it transparently.

Many video filters handle video streams in either RGB or YUV colorspace. Some can handle both.

The human eye is less sensitive to colour variations than to intensity variations. YUV allows the encoding of luminance (Y) information at full bandwidth and chrominance (UV) information at reduced bandwidth.

Often called component video, there are different standards for pro video and consumer video. YUV is used on such video types as Beta SP, a very common pro video editing format.